SECTION 07421 — COMPOSITE METAL BUILDING PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

Preformed composite metal-panel system for walls, with insulation, liners, related flashings, and accessory components

1.02 REFERENCES

A. The following documents form a part of these specifications to the extent stated herein.

B. American Concrete Institute (ACI)

ACI 301	Standard Specification for Structural Concrete

C. American Institute of Steel Construction (AISC)

Manual of Steel Construction

D. American Society of Civil Engineers (ASCE)

ASCE 7	Minimum Design Load for Buildings and Other Structures

E. ASTM International (ASTM)

ASTM A 446	Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality
ASTM E 84	Surface Burning Characteristics of Building Materials
ASTM E 283	Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E 331	Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

1.03 SYSTEM DESCRIPTION

System: Preformed and prefinished composite insulated, metal-panel system.

1.04 PERFORMANCE

A. Preformed metal-panel system shall withstand dead load and wind loads in accordance with ASCE 7 for wind speed of 72 mph, Exposure C, I = 1.07, and Maximum allowable deflection of span shall be 1/180.

B. Provide for expansion and contraction of system components due to ambient temperature and solar heat gain. Accommodate movement due to temperature change without buckling, undue stress on structural elements, reduction of performance, or other damaging effects.

C. Provide wall system tested and certified as follows:

C.1 Air Infiltration: ASTM E 283; maximum 1.09 cubic meters per hour per square meter (0.06) of wall area, at static air pressure difference of 75 Pa (1.57 psp).

C.2 Water Infiltration: ASTM E 331; no uncontrolled water leakage at an inward static air pressure difference of 8 psf.

C.3 Fire Test: ASTM E 84; flame spread 25 or less, fuel contributed 0, smoke developed, less than 450.

C.4 Thermal Cycling: Panel inner surface maintained at 100˚F, 500 cycles, with no evidence of delamination or panel failure.

C.5 Bond Strength: No meter corrosion at interface of primer. No delamination of foam from metal after 4500 hours at 158˚F, 100% relative humidity

D. System shall accommodate tolerances of structure: per AISC or ACI 301.

E. Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.

1.05 SUBMITTALS

A. Submit shop drawings, calculations, product data, and samples under provisions of section 01300 “Submittals.”

B. Shop Drawings: Indicate dimensions, panel layout, construction details, method of anchorage, method and sequence of installation.

C. Structural Calculations: Prepared, stamped, and signed by an civil or structural engineer licensed in the state of California. The calculations shall also include the thermal stress analysis to prove that the panels with the most critical color selected from manufacturer’s standard colors will not buckle.

D. Product Data: Include manufacturer's installation instructions.

E. Samples:

E.1 Sample of panel profile.

E.2 Panel color.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: A company with a minimum of 5 years' successful experience in the design, fabrication, and installation of metal panel systems with at least 5 projects comparable in size and nature to that required for this project.

B. Installer Qualifications: A company that has been approved by the panel manufacturer and has a minimum of 5 years' successful experience in preparing shop/erection drawings and installing foam-core insulated panels in horizontal application, with at least 5 projects similar in scope and size of this project. Submit the qualifications for approval within 10 calendar days from awarding the contract.

C. Field Measurements:

C.1 Measure in-place construction on which panel system will be installed if possible, before fabrication of panels. If not feasible, fabricate material to allow in-field trimming of panels to assure proper fit.

C.2 Coordinate field measurements and shop drawings with shop fabrication to minimize field adjustments, splicing, and mechanical joints.

D. Panels with thermal buckles or blisters are not acceptable.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Centria Architectural Systems "Formwall Dimension" series, METL Span "CF Architectural Wall Panel," or equal.

B. Substitutions: Under provision of section 01300 "Submittals."

2.02 SHEET METALS

Galvanized Steel Sheet: ASTM A 446, with minimum G90 zinc coating.

2.03 WALL SYSTEM

A. System Type: Factory foam-core insulated panels, horizontal design.

A.1 Panel Joints and Fastening: Interlocking double tongue and groove, concealed clips and fasteners.

A.2 Insulation: Expanded-in-place isocyanurate foam, fully bonded to inner and outer panel faces.

A.2.a Minimum R-value: 14.2 for 2 inch depth.

A.2.b Density: 2.3 lbs/w feet (minimum).

A.2.c Compressive Strength: 20 psi (minimum).

A.2.d Tensile Strength: 30 psi (minimum).

A.2.e The forming of the insulation shall be in a horizontal continuous process.

A.2.f Thickness: 2 inches.

A.3 Exterior Face: Galvanized sheet steel, minimum 22 gauge.

A.4 Interior Face: Galvanized sheet steel, minimum 22 gauge.

A.5 Exterior Finish: Fluoropolymer (refer to subpart 2.04).

A.6 Interior Finish: Manufacturer’s standard white color acrylic baked enamel.

A.7 Panel Width (nominal coverage): 30 inches.

A.8 Exterior Face Texture: Smooth (not stucco embossed).

A.9 Interior Face Texture: Stucco embossed.

B. Secondary Structure: Provide subgirts; purlins; and the like, of galvanized steel and of thickness if required for proper panel alignment to withstand required live and dead loads without excessive deflection, but not less than 12 gauge.

C. Concealed Panel Clips:

C.1 Fabricate from galvanized steel.

C.2 Provide panel system manufacturer's standard clips to suit project requirements, including but not limited to the following:

C.2.a Live loads.

C.2.b Thermal movement; accommodate expansion and contraction without introducing stress into wall system.

C.2.c Special conditions at transitions, penetrations, and terminations.

C.3 The panel clips must fasten to both exterior and interior faces.

D. Fasteners:

D.1 Threaded Fasteners - General: Provide manufacturer's standard corrosion-resistant fasteners of size and type required for intended application.

D.2 Rivets: Noncorrosive metal, compatible with metals to be fastened. Exposed-to-view rivets are allowed with University's approval.

E. Accessories:

E.1 Sheet Metal Closures, Flashing, and Trim: Fabricate from same type of sheet metal, and with same finish, as adjacent metal panels.

E.2 Concealed Sealant and Gaskets: Manufacturer's standard.

2.04 FINISHES

A. Fluoropolymer Finish:

A.1 Pretreatment: Caustic etch and conversion coating, each followed by water rinse.

A.2 Primer: Modified epoxy primer, minimum 0.2 mU thick; bake to cure.

A.3 Finish Coat: 70% "Kynar 500k', "Hylar 5000", or equal resin finish coat, minimum 0.8 mil thick; bake to cure; color to match existing Building 663.

A.4 Protective Film: Provide strippable plastic film, applied to finish of coil stock before forming

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate or structural system to receive work of this section is complete, properly sized, and is laid out correctly in plan and elevations.

B. Correct unacceptable substrate installations before start of metal panel erection.

C. Coordinate work with other adjacent elements of building envelope to ensure watertight construction.

3.02 INSTALLATION

A. General: Install manufactured metal panels in accordance with panel manufacturer's recommended practices.

A.1 Fasten panels to structure as necessary to comply with performance criteria, allowing for expansion and contraction due to temperature variations and building movement.

A.2 Install gaskets, sealants, closures, and trim as the work progresses to ensure airtight and watertight performance of the completed installation.

B. Wall System Installation:

B.1 Secondary Structure: Install panel supports, taking care to align members correctly for proper engagement of panel attachment system.

B.2 Foam-Core Wall Panel System Installation: Install wall panels using concealed clips in panel joints. Use of exposed fasteners is not permitted unless specifically approved by the Contracting Officer's Representative (COR).

B.3 Coordinate wall panel work with installation of doors, windows, and other elements of the wall to ensure continuous weathertight enclosure.

B.4 Exterior panels shall be wiped down with clean dry cloth at installation after strippable film is removed.

B.5 All wet sealants should marry at the vertical and horizontal joints.

B.6 Cutting, trimming, and sealing at panel openings and penetrations for items associated with the envelope such as light fixtures, outlets, and the like.

3.03 INSTALLATION TOLERANCES

Alignment: 1/4 inch in 20 feet for conformity of panel layout, vertical alignment, and panel joint location.

3.04 CLEANING AND PROTECTION

A. Remove protective coverings from prefinished metal surfaces after each panel is installed.

B. Replace damaged units and units which cannot be refinished to the COR's satisfaction. Field touch up is not acceptable unless specifically approved by panel manufacturer and the COR in writing.

C. Clean finished surfaces using techniques and materials recommended by panel manufacturer. Protect cleaned surfaces until project completion.

END OF SECTION

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